

Appl. No.: 10/599,023
Amdt. Dated June 12, 2008
Reply to Office Action of March 7, 2008

Amendments to the Drawings:

Figures 1 and 2 are being amended as suggested by the Examiner. A replacement drawing sheet is included with the present amendment.

REMARKS/ARGUMENTS

Claims 1-6 are pending. Claims 1 and 3-6 were rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,660,674 to Airhart and by U.S. Patent No. 4,655,314 to Airhart. Claims 1-6 were rejected as anticipated by U.S. Patent No. 4,390,077 to Fulkerson and by U.S. Patent No. 4,967,870 to Airhart.

Rejections Based on Airhart '674 and '314

These two patents have substantially similar disclosures and hence will be treated together. The Office Action asserted that the PCT Search Report describes how Claims 1 and 3-6 are rejected over the Airhart '674 and '314 patents. Applicant notes that the PCT Search Report cites Figures 1 and 4 and column 4, lines 27-46 of the '674 patent, and Figure 3 and col. 3, lines 50-66 of the '314 patent. However, these citations do not point out precisely how the present Examiner deems the '674 and '314 patents to disclose each and every element of the rejected claims, which puts Applicant at a disadvantage in responding to the rejections.

Nevertheless, Applicant respectfully disagrees with the rejections and submits that neither of the '674 and '314 patents anticipates the rejected claims. Claim 1 is directed to a device that can be mounted on a mobile platform for emitting seismic vibrations, the device comprising:

- a vibration assembly to send the vibrations into the ground, and
- a ground-hugging assembly for the device, **the ground-hugging assembly being intended to be fixed to the mobile platform and to transfer the load from the mobile platform, in a ground hugging direction, onto the vibration assembly fluttered against the ground, with the vibration assembly being fixed to the ground-hugging assembly by compensation members** designed to compensate for the perpendicularity anomalies between the general plane of the ground and the ground hugging direction,
wherein **the compensation members include long connecting elements**

having respective longitudinal axes and **designed to be driven in traction** along said respective longitudinal axes, **the long connecting elements each having one end mounted to the vibration assembly and an opposite end mounted to a fixed part of the ground-hugging assembly, each end of each long connecting element being free to rotate around at least one axis of rotation substantially perpendicular to the ground hugging direction.**

Airhart '674 discloses a device for emitting vibration waves, comprising an actuator assembly 14 having a reaction mass 24, and a target 15 that can be lowered from the vehicle onto the ground via fluid cylinders 26 that are rigidly affixed to the vehicle frame 29. Extension of the piston rods 31 of the fluid cylinders 26 urges the base plate 16 of the target 15 downwardly, thereby lifting the vehicle frame 29 until the vehicle tires 35 clear the ground, such that the weight of the vehicle is partially or fully borne by the target 15.

Guide shafts 37 also extend parallel to the cylinders 26, and are received through sleeve guides 36 on the frame 29, the lower ends of the guide shafts 37 being rigidly affixed to the cross beam frame 33 secured to the top of the base plate 16.

The target 15 may be regarded as a "ground-hugging assembly", since it engages the ground. From this description, it is apparent that the angular orientation of the target 15 (including the base plate 16) with respect to the vehicle frame 29 is invariable, since it can only translate in the direction dictated by the cylinders 26 and the guide shafts 37 and sleeves 36.

The actuator assembly 14 is connected to the vehicle frame 29. More particularly, the actuator assembly's lower end is pivotally connected by axles 44, 45 to a rectangular yoke 48. The yoke in turn is pivotally connected by axles 50, 51 to the vehicle frame 29. The pivot axis defined by the axles 44, 45 is perpendicular to the pivot axis defined by the axles 50, 51. This arrangement, which is essentially a two-axis gimbal, allows the axis of the actuator assembly 14 to be pivoted relative to the vehicle frame. Such pivoting is accomplished by hydraulic cylinders

60, 62, 64, 66 (Figure 3) for pivoting about one of the axes, and by hydraulic cylinders 100, 102 (Figure 6) for pivoting about the other axis.

Airhart '674 fails to teach or suggest certain limitations of Claim 1. First, Airhart's device does not have any **ground-hugging assembly intended to be fixed to the mobile platform and to transfer the load from the mobile platform, in a ground hugging direction, onto the vibration assembly fluttered against the ground.** In Airhart's device, the load of the vehicle platform 29 is not transferred by the target or ground-hugging assembly 15 onto the vibration assembly 14. Rather, the vibration assembly 14 is connected (via the yoke 48) to the vehicle platform 29. Separately and independently, the ground-hugging assembly 15 is connected (via the fluid cylinders 26 and their piston rods 31) to the vehicle frame 29.

Because of this fundamental difference alone, Airhart '674 does not anticipate Claim 1.

However, there are further important features of Claim 1 that Airhart fails to teach. Specifically, Airhart does not disclose any **compensation members comprising long connecting elements** having respective longitudinal axes and **designed to be driven in traction** along said respective longitudinal axes, **the long connecting elements each having one end mounted to the vibration assembly and an opposite end mounted to a fixed part of the ground-hugging assembly, each end of each long connecting element being free to rotate around at least one axis of rotation substantially perpendicular to the ground hugging direction.**

With respect to the hydraulic cylinders 60, 62 of Airhart '674, they each have one end pivotally connected (via pivot pin 84) to the vibration assembly 14. However, the opposite end of each hydraulic cylinder is not mounted to a fixed part of the ground-hugging assembly 15. Rather, the opposite ends of the cylinders 60, 62 are connected to the vehicle frame 29 via the yoke 48. This is entirely different from what is claimed in Claim 1.

For at least these reasons, Claim 1 is not anticipated by Airhart '674. Since Airhart '314 is similar in material respects to Airhart '674, it likewise does not anticipate Claim 1.

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Claims 3-6, since they depend from Claim 1, are also not anticipated by Airhart '674 or '314. Accordingly, Applicant respectfully submits that the rejections of Claims 1 and 3-6 based on the Airhart patents should be withdrawn.

Response to Rejections Based on Fulkerson

The Office Action asserted that the PCT Search Report describes how Claims 1-6 are rejected over Fulkerson. Applicant notes that the PCT Search Report cites Figure 4 and column 2, lines 38-56 of Fulkerson. However, this citation does not point out precisely how the present Examiner deems Fulkerson to disclose each and every element of the rejected claims, which puts Applicant at a disadvantage in responding to the rejections.

Nevertheless, Applicant respectfully disagrees with the rejections. Fulkerson discloses a device that is similar in many respects to Airhart's device. The device comprises a weight and hammer 36, 38 for hitting a support plate 60 laid on the ground. The support plate 60 is fixed to the vehicle chassis 12 of the mobile platform 10 via cylinders 72, 74 in order to transfer the load along a ground-hugging direction.

The ground-hugging assembly essentially consists of the support plate 60 and cylinders 72, 74. The "vibration assembly" 36, 38 is separately and independently fixed to the chassis 12 via a pair of cylinders 50, 56 (Figure 4) and the lifting means 40 for the weight 38.

Thus, Fulkerson's device does not have any **ground-hugging assembly intended to be fixed to the mobile platform and to transfer the load from the mobile platform, in a ground hugging direction, onto the vibration assembly fluttered against the ground**. In Fulkerson's device, the load of the vehicle chassis 12 is not transferred by the ground-hugging assembly 60, 72, 74 onto the vibration assembly 36, 38. Rather, the vibration assembly 36, 38 is connected (via the cylinders 50, 56 and lifting means 40) to the vehicle chassis 12. Separately and independently, the ground-hugging assembly 60, 72, 74 is connected to the vehicle chassis 12.

For this reason alone, Fulkerson fails to anticipate any of Claims 1-6.

Additionally, however, Fulkerson fails to teach any compensation members as claimed. The cylinders 50, 56 do not correspond to the claimed compensation members. While they each have one end pivotally connected to the vibration assembly, the opposite ends are not connected to the ground-hugging assembly, but rather are connected to the vehicle chassis 12 (see Figure 4).

For these reasons, Claims 1-6 are not anticipated by Fulkerson.

Response to Rejections Based on Airhart '870

In rejecting Claims 1-6 based on Airhart '870, the Office Action asserted that items 44 and 22 correspond to the compensation members of the claims.

Applicant respectfully disagrees that Airhart '870 anticipates the claims. In material respects, Airhart '870 is similar to Airhart '674. Members 22 are fluid cylinders (similar to cylinders 26 of Airhart '674) for lifting the vehicle off the ground so it is supported on the base plate 16. These cylinders 22 cannot be construed to be the claimed compensation members because they are not **designed to be driven in traction** along their respective longitudinal axes, they do not each have **one end mounted to the vibration assembly 28 and an opposite end mounted to a fixed part of the ground-hugging assembly 14, 16, nor** is each end free to **rotate around at least one axis of rotation substantially perpendicular to the ground hugging direction**. Indeed, cylinders 22 are not connected between the vibration assembly 28 and the ground-hugging assembly 14, 16, but rather are connected between the vehicle frame 12 and the ground-hugging assembly. Also, cylinders 22 are not rotationally mounted either to the ground-hugging assembly or to the vehicle frame.

Moreover, cylinders 22 do not compensate for perpendicularity anomalies between the general plane of the ground and the ground-hugging direction.

As for members 44, these are described as shock-isolating biasing members mounted between the frame 14 of the ground-hugging assembly and the base plate 16 of the ground-

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hugging assembly. Accordingly, members 44 do not correspond to the claimed compensation members because they are not **designed to be driven in traction** along their respective longitudinal axes, and they do not each have **one end mounted to the vibration assembly 28 and an opposite end mounted to a fixed part of the ground-hugging assembly 14, 16.**

No other elements of Airhart '870 correspond to the claimed compensation members.

Therefore, Applicant respectfully submits that Claims 1-6 are not anticipated by Airhart '870, and accordingly the rejections should be withdrawn.

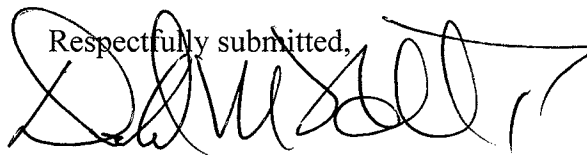
Finally, since none of the cited references teach or suggests a compensation member including a long connecting element having one end mounted to the vibration assembly and an opposite end mounted to a fixed part of the ground-hugging assembly, each end being free to rotate around at least one axis of rotation substantially perpendicular to the ground hugging direction, no combination of the cited references would have suggested the claimed device.

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Conclusion

Based on the above remarks, it is submitted that the application is in condition for allowance.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefor (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,


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